JOURNAL

OF THE

WASHINGTON ACADEMY OF SCIENCES

VOL. 19 OCTOBER 4, 1929 No. 16

BOTANY.—*Botanical notes on, and descriptions of, new and old species of Venezuelan plants.*—II. *Old and new species of Euphorbiaceae.*[1] H. PITTIER, Caracas, Venezuela.

Fragariopsis Paxii Pittier, sp. nov.

Scandens, caulibus teretibus, gracilibus, parce pilosulis; foliis membranaceis, palmatinerviis, petiolatis, petiolis mediocribus, pubescentibus, apice bistipellatis; laminis ovato-lanceolatis, basi subtruncatis abrupte cuneatis conspicue biglandulosis, apice tenuiter cuspidatis, marginibus dentato-sinuatis, costa venisque primariis supra subtusque plus minusve pubescentibus; floribus monoicis, inflorescentiis bisexualibus basi florem foeminaei unicum gerentibus, caeterum maribus; pedunculis rhachidibusque canopubescentibus; bracteolis lanceolato-acutis pubescentibus; floribus maribus numerosis, racemulosis, pedicellatis; pedicellis modice-longis, medio articulatis et minutissime bracteolatis, parce puberulis; alabastris minutissime puberulis pubescentibusve; calyce 4-lobulato, lobulis ovato-lanceolatis, acutis, glabris; staminibus 8–16, purpureis; filamentis nullis; antheris bilobulatis, lobulis discretis, rimosis; floribus foemineis maribus majoribus, longe pedicellatis pedicello medio articulato et bracteolato; sepalis 4, triangulari-acuminatis apice puberulis; ovario 4-loculari, depresso-globoso, extus pubescente; columna stylari elongata, crassa, purpurea, basi plus minusve puberula, apice stigmatibus 4, magnis, flavis coronata. Capsula deest.

Petioli 3 cm. longi; laminae 8.5–10 cm. longae, 3.5–4.5 cm. latae. Pedunculi 0.5–1.5 cm. longi; pedicellum floris maris 1–1.5 mm., foeminei 2–3 mm. longum. Sepala masc. 1.5 mm., foem. circa 2 mm. longa. Columna stylaris 5–6 mm. longa.

FEDERAL DISTRICT: Loma de En Medio, valley of Puerto La Cruz, 1000 m., in forest; flowers September 4, 1918 (*Pittier* 8109, type).

This is a very interesting addition to the flora of Venezuela, since the plant belongs without any possible doubt to a genus hitherto considered as monotypic and known only from South Brazil. The species is named in honor of Dr. F. Pax, the well known monographer of the Euphorbiaceae.

[1] The first contribution under this title appeared in THIS JOURNAL, 19: 175–186. 1929.
Received August 16, 1929.

Manihot remotiloba Pittier, sp. nov.

Arborescens, glaberrima, ramis brevibus, crassis; stipulis parvis, triangulari-acutis; foliis longissime petiolatis, ambitu reniformi, petiolo basi crasso apicem versus sensim attenuato, laminis amplis, supra viridis subtus glaucescentibus, fere usque ad basin 5-lobulatis, lobis remotis, angustis, lanceolatis, acuminatis, penninerviis, costa nervisque subtus prominulis, marginibus integris sinuatisve; inflorescentiis terminalibus, modice pedunculatis foliis multo brevioribus; floribus viridi-flavescentibus, masculis brevissime pedicellatis, bracteatis, bracteis oblongis obtusiusculis apice plus minusve denticulatis; alabastris globosis; calyce subcampanulato, lobulis ovatis, obtusis, extus glabris, intus pubescentibus; petalis nullis, disci glandulis liberis; staminibus 8, liberis, filamentis exterioribus antheris aequantibus, interioribus brevissimis, floribus foemineis masculis duplo longioribus; disci glandulis coalitis; ovario globoso, glabro; stigmatibus subsessilibus, purpureis; capsula magna, lignosa, globosa, tantum depressa; seminibus laevibus, griseis, ovoideis, depressis, ecarunculatis.

Arbor 3–4 m. alta. Petioli 10–22, plerumque circa 20 cm. longi; laminae 10 cm. longae, 16–18 cm. latae, lobulis 7.5–10 cm. longis, 3–4.5 cm. latis, externis brevioribus. Flores foeminei 10.5 mm. longi, pedicellis circa 7 mm.; flores masculi duplo breviori; filamenta staminum exteriorum circa 4 mm. longa. Capsula 1.3 cm. longa, 2 cm. lata; semina 9–10 mm. longa, 6–3.5 mm. lata, 4–5 mm. crassa.

YARACUY: In thorn bushes between Yaritagua and Urachiche, flowers and fruits April 10, 1925 (*Pittier* 11761, type).

Belongs to Sect. *Parvibracteatae*, Subsect. *Graciles* and takes place between *Manihot Catingae* Ule and *M. Johannis* Pax.

Manihot meridensis Pittier, sp. nov.

Frutex glaberrima, stipulis minimis caducis, foliis petiolatis, petiolo modice longo, laminis subreniformibus, basi aperte cordatis, fere usque ad basin 3-lobulatis, lobulis ovato-lanceolatis, acuminatis, medio integro, lateralibus plus minusve sinuatis basi extus saepissime semi auriculatis, auricula oblonga, sinuata; inflorescentiis axillaribus, subspicatis; bracteis minutissimis, caducis; floribus longe pedicellatis, basalibus 2 foemineis demum masculis; calyce floris maris globoso, extus glabro, intus pubescente, lobulis oblongis, obtusis; staminibus 10 utrinque hirtellis; filamentis 4 exterioribus brevibus, interioribus subaequantibus; sepalis floris foeminei fere liberis, maris triplo longioribus, ovato-lanceolatis; disci glandulis adhaerentibus, apice plus minusve reflexis; ovario globoso; stylis cohaerentibus; stigmatibus purpureis.

Petioli 2.5–4 cm. longi; laminae 4–5 cm. longae, 5.5–10 cm. latae; lobuli 3.5–4.5 cm. longi, 1.5–2.2 cm. lati, exteriori breviores. Inflorescentiae 7–9 cm. longae; pedunculi 3–4.5 cm. longi, pedicelli 0.5–1 cm. longi, maris foemineis dimidio breviores. Flores masculi 6–7 mm., foeminei 11–13 mm. longa; filamenta 2–4.5 mm. longa; antherae 4 mm. longae.

MÉRIDA: Lagunillas, 700 m., flowers March 13, 1922 (*A. Jahn* 1000, type).

This low shrub belongs to section *Heterophyllae* and is remarkable for its large female flowers and its 3-lobate leaves, with the exterior lobes almost always auriculate on the outer side. It probably should be placed in the group of the *Variifoliae*, not represented heretofore in northern South America.

Mabea microcarpa Pittier, sp. nov.

Arbor parva, coma expansa, rotundata, ramulis gracilibus, virgatis, cortice glaberrimo obscure brunneo tectis; foliis coriaceis, in sicco nigrescentibus, petiolatis, petiolis brevibus, canaliculatis, glabris, laminis ovalibus, basi rotundatis, apice abrupte cuspidato-acuminatis, minutissime mucronulatis, marginibus serrulatis, supra sublucidis, obscure venosis, subtus pallidioribus costa venisque secundariis circa 12 prominentibus, venulis prominulis; inflorescentiis terminalibus, anguste paniculatis, pedunculatis, pedunculis bifidis ramulosisve, ramulisque copiose bracteosis; bracteis lineari-acuminatis, glabris vel leviter puberulis; ramulis masculis laxis, elongatis, umbellulatim 1-3-floris, prope basin biglanduliferis, rhachi pedicellisque minutissime rufo-puberulis, oblongis; glandulis floris maris validis, oblongis, juxtapositis nigrescentibus; pedicellis gracillimis; bracteola ovato-acuta, puberula, integra vel minutissime remoto-denticulata, eglandulosa, sepalis triangularibus, acutis, puberulis; staminibus 22–24; bracteis floris foeminei 3, linearibus, puberulis, lateralibus brevioribus; pedicello puberulo, basi glandulis 2, parvis, rotundatis suffultis; calyce puberulo, sepalis exterioribus 3 interioribus minoribus, ovato-lanceolatis, acutissimis; ovario subgloboso, columna stylari elongata et stylorum parte libera columna breviora omnino rufo-tomentellis; capsula parva, globosa, basi apiceque plus minusve truncata, profunde sulcata, parce ochraceo-tomentella, calyce persistente suffulta; semina obovoidea, leviter compressa, apice subretusa, vix carunculata, laevia, badia.

Arbor 3–4 metralis. Petioli 4–5 mm. longi; laminae 5.5–8.5 cm. longae, 2.5–3.5 cm. latae. Paniculae 10–14 cm. longae. Ramuli florum marium 3–3.5 mm. longi; bracteolae 2 mm. longae; pedicelli basi articulati 4–5 mm. longi; florum diam. 2.5–3 mm. Flores foeminei: bracteae 3.5–6 mm. longae; pedicelli 4.5 mm. longi; sepala 1.5–2.5 mm. longa; columna stylari 7.5 mm. longa. Capsula 9–10 mm. longa lataque; semina 4.5 mm. longa, 4.5 mm. lata.

ZULIA: Along Río Lora, in primeval forest, flowers and fruits December 13, 1922 (*Pittier* 10931, type).

Determined at first as *M. occidentalis* Benth., but not properly referable to that group because it apparently has more than 24 stamens; its place is rather near *M. lucida* Pax & Hoffm., from which it differs mainly in the size of the capsule, the shape and size of the leaves, and in the glandular bracts of the female flowers.

Mabea longepedicellata Pittier, sp. nov.

Arbor mediocris, lactescente, coma elongata, ramis ramulisque virgatis dense hirtellis, foliis chartaceis, petiolatis, interdum oppositis; petiolis gracilibus, parce hirtellis, canaliculatis; laminis oblongis oblongo-lanceolatisve, basi rotundatis apice subtiliter apiculato-acuminatis, marginibus obtuse serrulatis revolutisque, supra sublucidis in sicco virescentibus, subtus glaucescentibus secundum marginem punctis glanduligeris ornatis, costa prominente basin versus saepe puberula, venis primariis 11–14 vix prominulis, venulis inconspicuis, acumine saepe tomentello; paniculis terminalibus multifloris rhachi tenuiter rufo-hirtella; ramulis maribus 2–3-floribus supra basin validissime biglandulosis, glandulis oblongis; bractea ovato-acuta dense puberula; pedicellis longissimis densiuscule griseo-tomentellis, medio articu-

latis; calyce cupulato, 5-6-dentato, extus griseo-tomentello; staminibus 12–20, antheris puberulis; floribus foemineis basin inflorescentiae paucis, longissime pedicellatis, pedicellis basi bracteatis, calyceque griseo-tomentellis; bracteis lanceolato-linearis, longe acuminatis, basi biglandulosis; calyce cupulato mari majore, 6-lobulato, lobis exterioribus minoribus; ovario subgloboso, columna stylari e basi sulcata stylorum parte libera multo breviora. Capsula immatura griseo-tomentella, majora, ovoidea vel subglobosa.

Arbor 8–10 metralis. Petioli 9–11 mm. longi; laminae 6–10 cm. longae, 2–3.5 cm. latae. Paniculae 10–12 cm. longae. Ramuli florum marium circa 3 mm. longi; glandulae 2 mm. longae. Bractea plus minusve 1 mm. longa. Pedicelli 6.5–14 mm. longi. Calyx circiter 1.8 mm. diam. Flores foeminei: Bractea 10–11 mm. longa. Pedicelli 16–18 mm. longi. Calyx 2 mm. longus (5 mm. diam.). Ovarium 2.5 mm. longum. Columna stylaris circa 6 mm. longa; stylorum pars libera 8–10 mm. longa. Capsula immatura 14 mm. longa.

PORTUGUESA: Between Aparición and Ospino, in forest, flowers December 26, 1925 (*Pittier* 12013, type).

Very closely related to *M. lucida* Pax & Hoffm., but differs in the indumentum of the branchlets and leaves, the dimensions of the inflorescences, the length of the pedicels, etc.

SAPIUM AUCUPARIUM Jacq., Enum. Pl. Carib. 31. 1760

Sapium albomarginatum Pax & K. Hoffm., Pflanzenreich 4, 147[17]: 203. 1924

The materials of the species of *Sapium* most common in the tierra caliente of the central parts of Venezuela were all referred in Washington to *S. Hippomane* Meyer. Pax and K. Hoffmann, on the other hand, described as belonging to a new species the specimens collected in the streets of Valencia. After a careful study of both dry and living materials, I have come to the conclusion that they all belong to *S. aucuparium* Jacq. In the first place, the spikes are never "subaggregatae" as indicated in Meyer's diagnosis, but always solitary. Neither are the leaves "obsolete serrulatis," but as a rule very neatly serrulate, though Pax and Hoffmann altered the "glanduloso-serrulatis" of Meyer, and "serrata" of Jacquin into "obscure serrulata." As to the shape of the leaves, it is found to vary greatly on the same tree and the marginal glands are no specific character in the present case. The sterile branchlets have larger leaves and in these the apex is seldom cucullate, though it invariably ends in a large gland. The margin is always more or less distinctly bordered with a cartilaginous nerve, of more or less light color, and, in the Valencia specimens, the female flowers have a 3-partite perianth, a globose ovary with the styles shortly connate, and the seeds measure about 5 mm. in length and width. It should also be mentioned that Vargas specimens, from Caracas, in the De Candolle Herbarium, were determined as *S. aucuparium*. According to my experience, the only *Sapium* found in the valley of Caracas is identical with the one common at Valencia and elsewhere in the lowlands. The close examina-

tion of the Venezuelan materials also have confirmed the opinion expressed elsewhere,[2] that *S. moritzianum* Klotzsch is, if not identical, at most a mere variety of *S. aucuparium* Jacq.

Sapium guaricense Pittier, sp. nov.

Arbor mediocris glabra, decidua, trunco erecto, ramis ramulisque cortice griseo subpapyraceo tectis; stipulis parvis, acutis, integris, scariosis, caducis; foliis mediocris, membranaceis, petiolis brevibus, canaliculatis, apice glandulis 2, crassis, retrocurvatis ornatus; laminis ovalibus, basi rotundatis late cuneatisve, apice planis abrupte brevissimeque acuminatis, acumine diminuto, minute fimbriato-glanduloso; marginibus elegantiter glanduloso-serrulatis, serraturis hic inde hydathodibus late perforatis intermixtis, supra laete viridis, subtus pallidioribus costa prominente, venisque primariis circa 12 parum obliquis arcuatis venulisque bene conspicuis; spicis in ramulis defoliatis lateralibus terminalibusque omnino masculis; glandulis mediocribus, ovatis, approximatis; bracteis parvis, late ovatis, subacutatis obtusisve, 7–11-floribus; floribus brevissime pedicellatis; calyce globoso, lobulis 2 imbricatis; staminibus 2 bene exsertis; et caeteris ignotis.

Arbor 8–10 metralis. Petioli 6–8 mm. longi; laminae 6–10 cm. longae, 2–3.5 cm. latae. Stipulae circa 2 mm. longae. Spicae 5–10 cm. longae.

GUÁRICO: Llanos de la Rubiera, in deciduous forests, male flowers only, April 12, 1927 (*Pittier* 12331, type).

Notwithstanding the young condition of the specimens and the absence of female flowers and capsules, this tree is sufficiently characterized as a new species of the *Planifolia*, but it is not possible, at present, to define its nearest affinities.

Sapium naiguatense Pittier, sp. nov.

Arbor mediocris, glabra, ramulis teretibus, cortice brunneo laevi tectis; foliis subcoriaceis, longe petiolatis, petiolo canaliculato, apice glandulis 2, validis, manifeste retroflexis, ornato, laminis late ovatis obovatisve basi cuneatis apice late rotundatis abrupte minute apiculatis acumine cucullato, supra saturate viridis subtus pallidioribus costa valida prominentissima, venis primariis 16–19 prominentibus, basi costa fere perpendicularibus, demum arcuatis, venulis prominulis, marginibus remote serrulatis, valde revolutis; floribus desunt; capsula breve stipitata, glabra, depresso-globosa, nigrescente; seminibus parvis, tuberculatis, orbicularibus.

Arbor 10 m. alta, basi 30 cm. crassa. Petioli 1–1.7 cm. longi; laminae 5–12 cm. longae, 3–5.5 cm. latae. Capsula cum stipite 1.1–1.2 cm. longa, 1.3 cm. lata; semina 5–5.5 mm. longa lataque.

FEDERAL DISTRICT: Naiguatá at 50 meters above sea-level, in cultivated places, fruits July 14, 1924 (*Pittier* 11832, type).

A remarkable species with stipitate capsules and inflexed glands. Belongs to Subsection *Cucullata*.

[2] Contr. U. S. Nat. Herb. **20**: 129. 1918.

Sapium paucistamineum Pittier, sp. nov.

Arbor mediocris, glabra, ramulis nodulosis, griseo-brunneis; foliis parvis, membranaceis; petiolis gracilibus, late canaliculatis, apice glandulis 2, parvis, brevibus, ornatis; laminis oblongis obovatisve, basi cuneatis interdum rotundatis, apice late obtusis acuminulatis acumine cucullato, supra-viridis subtus vix pallidioribus, costa prominente, venis primariis obliquis, vix arcuatis vix conspicuis; marginibus remote glanduloso-serrulatis, revolutis; spicis brevibus, terminalibus; basi 4–6 floribus foemineis sessilibus apice floribus masculis paucis gerentibus; glandulis florum foeminarum minimis orbicularibus; bractea minima, margine fimbriata; calyce bilobulato; ovario globoso, stylis basi longe connatis; glandulis florum masculorum magnis, ovatis, cohaerentibus; bractea parva, margine subintegra, floribus 1–2, pedicellatis; calyce bilobulato; staminibus 2, exsertis. Capsula deest.

Arbor 10–12 m. alta. Petioli 4–6 mm. longi; laminae 3–6 cm. longae, 1.6–2.6 cm. latae. Spicae 5–7 cm. longae.

TRUJILLO: Valera, 550 m., in bushes along Escuque River, flowers November 20, 1922 (*Pittier* 10750, type).

Very peculiar type of Subsection *Cucullata*, characterized mainly by its depauperate male spikelets, numerous female flowers and small leaves.

Euphorbia guanarensis Pittier sp. nov.

Fruticulosa, perennis, caulibus crassis, ramis ramulisque dichotomis, brevibus, crispulo-pubescentibus; foliis parvis, subcoriaceis, petiolatis, utrinque hirtellis; petiolis brevibus, laminis ovalibus, ovato-oblongis oblongisve, basi rotundatis cuneatisve, trinerviis, apice obtusis, marginibus integris vel obsolete dentatis, valde revolutis; stipulis lineari-setaceis, petiolis subaequantibus; cimis terminalibus, plurifloribus, bracteolis lanceolatis acutis pubescentibus, hirtulis, suffultis; involucris pedicellatis, campanulatis, minute puberulis, rubescentibus, lobulis orbiculari-ovatis, candidis; glandulis 4, fimbriatis; ovario crispulo-tomentello, globoso, stylis 3, brevibus, clavatis bilobulatisve coronato; capsula densiuscule cano-pubescente; seminibus laevibus, ecarunculatis, basi minutissime puberulis.

Plantula tota 5–6 cm. alta. Petioli circa 1 mm. longi; laminae 5–9 mm. longae, 2.5–5 mm. latae. Pedicelli 2–3 mm. longi. Involucra circa 3 mm. longa, lobulis 0.7–0.8 mm. longis latisque. Capsula 1.5–2 mm. longa, 2 mm. diam.

PORTUGUESA: Hato de Mata Verde near Guanare, in recently burnt savannas, flowers and fruits December 30, 1925 (*Pittier* 12072, type).

The place of this species seems to be among the *Chamaesyceae* with smooth seeds, differing at first sight from *E. amannioides* and *E. serpens* in the general hairiness.

Euphorbia meridensis Pittier, sp. nov.

Perennis, utrinque glabra, caulibus lignosis, crassis, brevibus, ramulosis, ramulis tenuibus, quadrangulis, ad nodulos incrassatis; foliis oppositis, petiolatis, coriaceis, saepe rubescentibus, petiolis brevibus, laminis obovatis ovatisve, basi subcordatis rotundatisve, apice rotundatis, mucronulatis, integris; stipulis albescentibus, geminis, triangulari-lanceolatis, minimis, denticulatis, apiculatis; involucris incarnatis, in axillis supremis solitariis, pedicellatis, infundibuliformibus, lobulis suborbicularibus, apice subtruncatis,

obsolete sinuato-denticulatis; glandulis 4-ovatis, purpureis, exappendiculatis; stylis 3, brevibus, capitellatis; capsula laevia, coccis carinatis; seminibus oblongis, laevibus, ecarunculatis.

Fruticulus 5–15 cm. alta. Petioli circa 1 mm. longi; laminae 3–6 mm. longae, 2–3.5 mm. latae. Stipulae 1 mm. longae vel minores. Capsula circa 2 mm. longa.

MÉRIDA: Páramos de los Apartaderos, 3300 m., flowers and fruits January 22, 1922 (*Jahn* 976, type).

This dwarf shrub probably belongs to Subsection *Chamaesyceae* Boiss. The diminutive involucres are solitary, the glands large and without appendages. We have no means at hand to ascertain its closest affinities. In the Prodromus there is no description, among those of American species, which would fit our specimens.

ZOOLOGY.—*Some reef corals from Tahiti.*[1] J. EDWARD HOFFMEISTER, University of Rochester. (Communicated by JOHN B. REESIDE, JR.)

The corals listed here were obtained by Dr. William A. Setchell and Mr. Harold E. Parks of the University of California from the barrier and fringing reefs around Papeete, Tahiti. There are 24 species recorded. All are typical shallow water, reef corals and most of them are common to Oceania and the surrounding areas. Some were taken from exposed parts of the barrier and fringing reefs and others from more protected areas of the reefs. One new species is recorded.

POCILLOPORA DAMICORNIS var. CESPITOSA Dana

1925. *Pocillopora damicornis* Hoffmeister, Carnegie Inst. Wash., Pub. 343, p. 15, plate 1, fig. 1. (With synonymy).

I have discussed *Pocillopora damicornis* Linnaeus and its varieties in the above mentioned publication.

Station No. 6046. Loose (dead) on Arue Reef.
No. 6084. On outer edge of exposed fringing reef, Arue.

POCILLOPORA EYDOUXI Milne Edwards and Haime

1918. *Pocillopora eydouxi* Vaughan, Carnegie Inst. Wash., Pub. 213, p. 79, plate 24, figs. 1, 2, 2a. (With synonymy).

The calices of this species possess well developed septa and a large styliform columella. There are 12 septa, all of nearly the same size. Coenenchymal granulations consist of erect spinules. *P. plicata* Dana, *P. elongata* Dana, *P. coronata* Gardiner and *P. modumanensis* Vaughan are closely related species.

Station No. 6051. On outer (exposed) rim of barrier reef off Papeete, Tahiti.

[1] Received July 25, 1929.

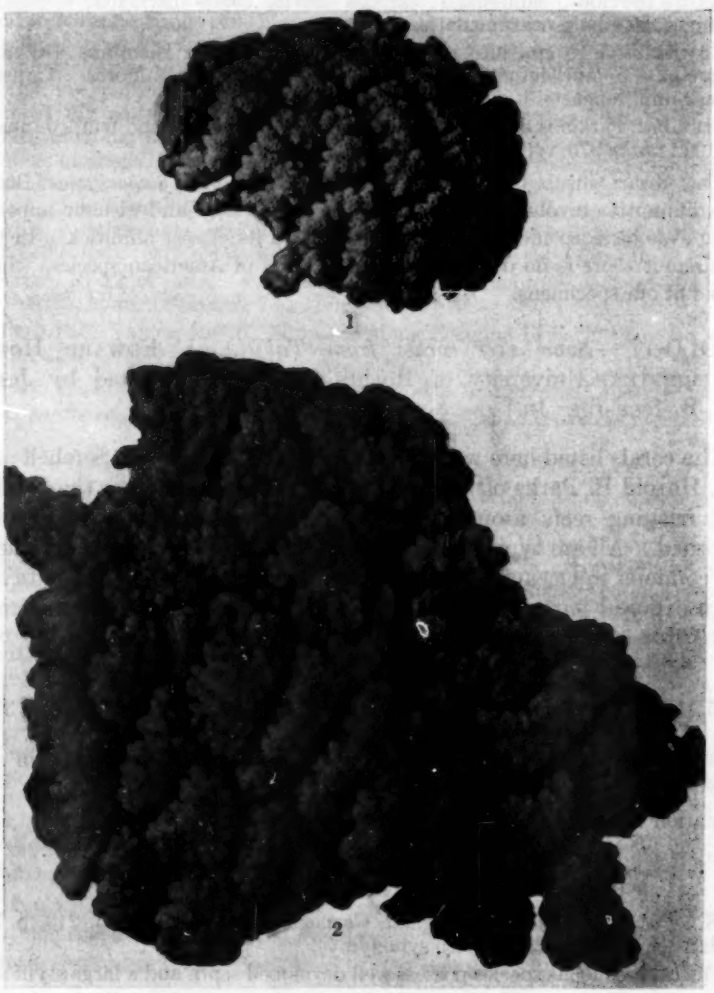

PLATE 1

Fig. 1. *Pocillopora setchelli* Hoffmeister, n. sp. Dana's specimen No. 3979. In U. S. National Museum. Seven-eighths natural size.

Fig. 2. *Pocillopora setchelli* Hoffmeister, n. sp. TYPE. Seven-eighths natural size.

POCILLOPORA DANAE Verrill. Plate 2, fig. 2

1918. *Pocillopora danae* Vaughan, Carnegie Inst. Wash., Pub. 213, p. 77, plate 22, figs. 1, 1a, 2. (With synonymy).

One specimen agrees in most respects with the type. The bottoms of most of the calices are granulate, with no definite columella. In a few places, however, there is a distinct spine-like columella. The septal characters are typical of *P. danae*. The verrucae are not so large and tumid as those of the Murray Island specimens described by Vaughan, and thus are closer to the type.

Station No. 6085. On outer exposed edge of fringing reef at Arue.

POCILLOPORA MEANDRINA var. NOBILIS Verrill

1846. *Pocillopora verrucosa* (part) Dana, Zooph. Wilkes Expl. Exped., p. 529, pl. L, figs. 3, 3a. (Not Ellis and Solander).
1864. *Pocillopora nobilis* Verrill, Bull. Mus. Comp. Zool., 1, p. 59.
1907. *Pocillopora meandrina* var. *nobilis* Vaughan, Bull. 59, U. S. Nat. Mus., p. 98, pl. XIV, figs. 3, 4; pl. XXII, figs. 1, 1a, 2, 2a; pl. XXIII.

Vaughan has discussed this species in detail in his above mentioned paper. Verrill's *P. nobilis* is certainly to be placed with *P. meandrina* Dana. The *nobilis* variety can be distinguished by the somewhat larger and less crowded septa, and slightly larger calices. In the Tahiti specimen a few of the calices, even in the basal parts of the corallum, have septa which are fairly well developed. This is rare however; in most places they are obsolete or very poorly developed.

Station No. 6072. An important rosette coral on outer (exposed) edge of barrier reef off Papeete, Tahiti.

Pocillopora setchelli Hoffmeister, new species. Plate 1, figs. 1, 2; plate 2, fig. 1

One specimen agrees very well with one of Dana's specimens, No. 3979 U. S. Nat. Mus. The locality of Dana's specimen is unknown and no specific name is applied. The following is a description of the Tahiti specimen:

Corallum rising from a relatively small base, sending fronds upward at every angle and forming a low, eventopped, cespitose structure. The fronds are about 4 cm. high, are tightly packed together, and appear squeezed and flattened out by the encroachment of neighboring fronds. The distance from the verrucae near the summit of one frond to those of the adjoining one is about 3 or 4 mm. Thus the space between the fronds is very narrow. The fronds are rather broad and thin. They average 3 cm. in breadth by 9 mm. in thickness including the verrucae. At times, however, they are more clump-like, thicker and shorter.

Verrucae cover the sides and tops of the fronds. They are not so numerous near the base as higher up. In most places they are 2 mm. high; diameter 2 by 2.5 mm. and 2 by 3 mm. Characteristically run in parallel rows up the side of the fronds; rows 1.5 mm. apart. The lateral verrucae are inclined towards ends of branches.

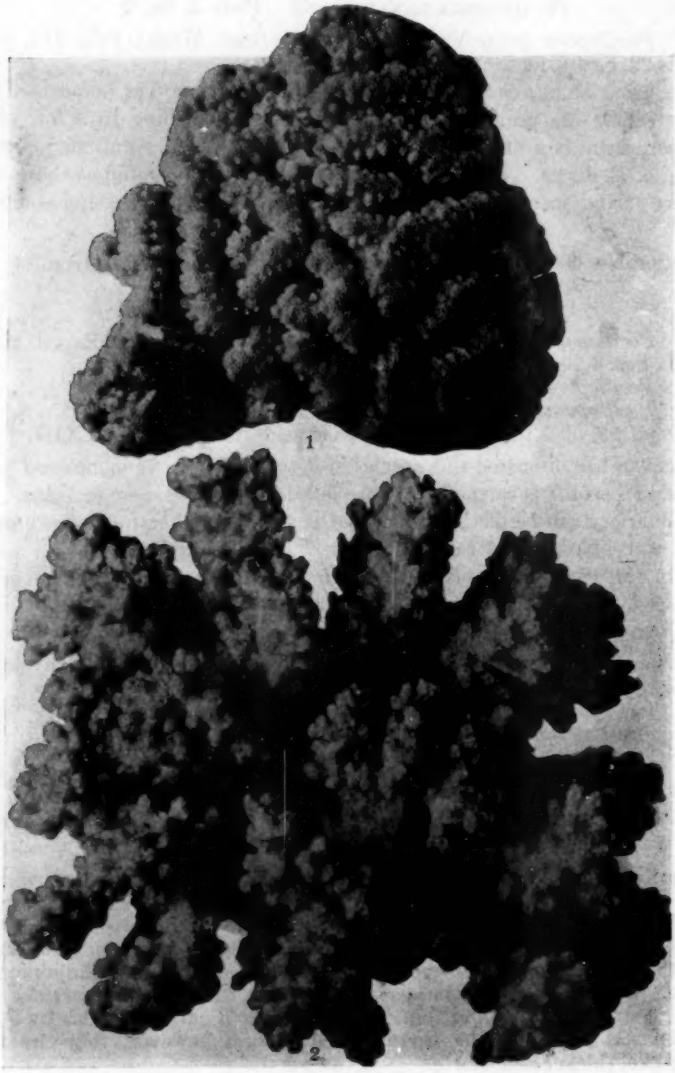

PLATE 2

Fig. 1. *Pocillopora setchelli* Hoffmeister, n. sp. From barrier reef off Papeete Harbor, Tahiti. Collected by Albatross Expedition (1899–1900). Five-sixths natural size.
Fig. 2. *Pocillopora danae* Verrill. Five-sixths natural size.

Calices variable in diameter, 0.5 mm. to 1 mm. Between the verrucae on the tips of the fronds they are in places a little less than 0.5 mm. in diameter. The intervening walls are thin at and near summits of fronds; thicker in older portions, in places 1 mm. About 24 erect granules top walls surrounding thin-walled calices. Coenenchyma compact; surface granulate. No septa visible; no columella; bottom of calices rather smooth.

This species appears to be related to *P. brevicornis* Lamarck. The compact and compressed arrangement of the fronds and the even-topped corallum are distinctive characteristics.

Two specimens of this species in the U. S. National Museum were collected by the Albatross Expedition (1899–1901) from the barrier reef off Papeete Harbor, Tahiti. They show a few calices with septa very slightly developed. Plate 1, fig. 2 shows one of these specimens. Plate 1, fig. 1 shows Dana's specimen No. 3979, U. S. Nat. Mus.

TYPE: U. S. National Museum.

Station No. 6073. Inner (protected) slope of barrier reef off Papeete, Tahiti.

LEPTASTREA PURPUREA (Dana)

1846. *Astraea purpurea* Dana, U. S. Expl. Exped., Zooph., p. 239, plate 12, figs. 10, 10a–10c.
1925. *Leptastrea purpurea* Hoffmeister, Carnegie Inst. Wash., Pub. 343, p. 20. (With synonymy).

One specimen of this well known and widely distributed species was collected at Tahiti. To my knowledge this is the first specimen recorded from there.

Station No. 6048. Loose, dead, on fringing reef at Arue.

FUNGIA CONCINNA Verrill

1902. *Fungia concinna* Döderlein, Korallengat. Fungia, p. 113, pl. 12, figs. 1–2; pl. 13, fig. 4.
1918. *Fungia concinna* Vaughan, Carnegie Inst. Wash., Pub. 213, p. 127. (With synonymy).
1921. *Fungia concinna* van der Horst, Madrepor. of Siboga Exped., part 2, p. 11. (With synonymy).

There are two typical specimens in the collection and one which is distorted. One of the former has flat, relatively thin corallum. Measures 117 mm. by 113 mm. and is nearly 15 mm. thick. The spines on the septa number from 5 to 9. The spines on the under surface are rather large; about 10 of the larger ones occupy 1 cm.

A good suite of this species was collected by the Albatross expedition of 1899–1901 and is in the U. S. National Museum.

Station No. 6060. On inner (protected) slope of barrier reef off Papeete, Tahiti.

PAVONIA PRAETORTA Dana

1846. *Pavonia praetorta* Dana, U. S. Expl. Exped., Zooph. p. 325, plate 22, figs. 5, 5a.

The species forms rounded, even, hemispherical clumps. The crispate fronds are narrow, thin and very twisted and have curled summits. The ambulacra are practically flat. The septa alternate in size although in nearly all places the smaller are almost as large as the others. The columella in the Tahiti specimens is indistinct in many calices.

Station No. 6068. On (protected) inner part of combination reef at Atiue.
No. 6053. On inner (protected) slope of barrier reef off Papeete, Tahiti.
No. 6086. On protected fringing reef at Auae, near Papeete, Tahiti.

PSAMMOCORA SAMOENSIS Hoffmeister

1925. *Psammocora samoensis* Hoffmeister, Carnegie Inst. Wash., Pub. 343, p. 46, plate 5, figs. 3a, 3b, 3c.

This belongs to the massive species of *Psammocora* and somewhat resembles *P. nierstraszi* van der Horst (Siboga Exped., part 2, 1921, p. 34, pl. 2, figs. 3, 4). The Tahiti specimen is close to No. 2 from Samoa described in Pub. 343 Carnegie Inst. Wash., p. 46. It is a small, irregularly shaped mass covered with twisted ridges.

Station No. 6047. Loose, rolling about, but living; surface of fringing reef at Arue.

MONTIPORA GRACILIS Klunzinger

1879. *Montipora gracilis* Klunzinger, Korallenthiere des Rothen Meeres, ii, p. 37, pl. VI, fig. 7; pl. V, fig. 12; pl. X, fig. 9.

Station No. 6070. Protected surface of combination reef at Atiue.

MONTIPORA AUSTRALIENSIS Bernard

1897. *Montipora australiensis* Bernard, Brit. Mus. Cat. Madrepor., vol. 3, p. 95, pl. 17, fig. 3; pl. 33, fig. 8.

In the U. S. National Museum there are several specimens of this species from Tahiti. Most of them are larger than the one obtained by Setchell and Parks. Bernard's description and plates give a good picture of the species. This species and the preceding one belong to the papillate group.

Station No. 6057. Lurid purple, encrusting coral, very common on protected portions of both fringing and barrier reefs off Papeete, Tahiti.

ACROPORA FORMOSA (Dana)

1846. *Madrepora formosa* Dana, U. S. Expl. Exped., Zooph., p. 473.
1846. *Madrepora brachiata* Dana, U. S. Expl. Exped., Zooph., p. 474.
1846. *Madrepora gracilis* Dana, U. S. Expl. Exped., Zooph. p. 482.
1893. *Madrepora formosa* Brook, Cat. Genus Madrepora, p. 43.
1925. *Acropora formosa* Hoffmeister, Carnegie Inst. Wash., Pub. 343, p. 55, pl. 8, figs. 1, 2a, 2b, 3a, 3b.

I have discussed this species in my Samoan report and have combined *A. brachiata* (Dana) and *A. gracilis* (Dana) with it as varieties. The *gracilis* variety has thinner stems than the *brachiata* variety and the two grade into each other. I am referring the two branches from Tahiti to *A. formosa* var. *gracilis* (Dana).

Station No. 6067. Low, scattering, on shallows of protected fringing reef off Fareute Point, Papeete, Tahiti.

ACROPORA CORYMBOSA (Lamarck)

1893. *Madrepora corymbosa* Brook, Cat. Genus Madrepora, p. 97.
1918. *Acropora corymbosa* Vaughan, Carn. Inst. Wash., Pub. 213, p. 171, pl. 67, fig. 1. (With synonymy).

Four specimens of various sizes were collected. One (No. 6052) has a small, cespitose corallum which has not as yet taken on the corymbose form. The other three are more mature. Besides these there are quite a few other specimens in the U. S. National Museum belonging to this species. One was collected by the Albatross Expedition of 1899–1901, from Papeete Harbor, Tahiti; one was sent by Dr. Fred Baker from Fanning Island, one by Dr. F. Wood Jones from Cocos-Keeling, and Dr. Alfred Mayor collected several from Pago Pago Harbor, Tutuila, Samoa.

Station No. 6074. Inner (protected) slope of barrier reef off Papeete.
Nos. 6062, 6063. Exposed edge of fringing reef along the pass at Atiue.
No. 6052. On outer edge (exposed) of barrier reef off Papeete.

ACROPORA LEPTOCYATHUS (Brook)

1893. *Madrepora leptocyathus* Brook, Cat. Genus Mad., p. 159, pl. 16, fig. C.
1925. *Acropora leptocyathus* Hoffmeister, Carnegie Inst. Wash., Pub. 343, p. 67, plate 17, figs. 1a to 1d.

I am placing with this species two specimens which differ somewhat from typical *A. leptocyathus*. They are close enough to be regarded a variety. I have examined a large suite of specimens of the species from Samoa and am familiar with the variation within it. The Tahiti specimens possess axial corallites which are slightly larger in diameter than is customary. They measure in places as much as 3 mm. to 3.5 mm. across. Some of the Samoan specimens have axial corallites of 3 mm. diameter also, although this is not typical.

Stations No. 6069, 6065. Outer (exposed) margin of fringing reef of pass at Atiue.

ACROPORA NASUTA (Dana)

1846. *Madrepora nasuta* Dana, U. S. Expl. Exped., Zooph. p. 453, plate 34, figs. 2, 2a, 2b.

Dana's types of this species from Tahiti are in the U. S. National Museum.

Station No. 6064. Outer margin (exposed) of fringing reef of pass at Atiue.

No. 6075. Inner slope (protected) of barrier reef off Papeete, Tahiti.

ACROPORA PAXILLIGERA (Dana)

1893. *Madrepora paxilligera* Brook, Cat. Mad. Corals in Brit. Mus. (Nat. Hist.), vol. 1, p. 74.

Besides Tahiti the species has been reported from Fiji and the Mergui Archipelago.

Station No. 6077. Inner (protected) slope of barrier reef off Papeete, Tahiti.

ACROPORA PLANTAGINEA (Lamarck)

1893. *Madrepora plantaginea* Brook, Cat. Mad. Corals in Brit. Mus. (Nat. Hist.), p. 156. (With synonymy).

The species is quite similar to Dana's *A. retusa*. It has been reported from Samoa, Singapore and Ceylon besides Tahiti.

Station No. 6076. Inner (protected) slope of barrier reef off Papeete.

ACROPORA PECTINATA (Brook)

1918. *Acropora pectinata* Vaughan, Carnegie Inst. Wash., Pub. 213, p. 172, plate 71, figs. 1, 1a, 1b, 1c, 2.

Station No. 6050. Scattered along the outer (exposed) edge of the fringing reef at Arue.

ACROPORA CYTHEREA (Dana)

1846. *Madrepora cytherea* Dana, U. S. Expl. Exped., Zooph., p. 441, pl. 32, fig. 3.

1893. *Madrepora cytherea* Brook, Cat. Genus Madrepora, p. 99.

This is one of the most characteristic species of Tahiti. There are a number of immense specimens from that locality in the Dana collection in the U. S. National Museum including the type. The species seems to pass through the same growth stages as are characteristic of *A. hyacinthus* Dana, which is described in my Samoan report.

Station No. 6045. Outer (exposed) rim of reef at Arue.

No. 6058. Scattered platform corals on inner slope (protected) of barrier reef off Papeete. The solid vasiform bases of old specimens are so very large as to form "negro heads" when tossed about on the reef. They ring like metal when struck with the hammer.

PORITES LATISTELLATA Quelch

1886. *Porites latistellata* Quelch, Chall. Exped., XVI: 185; pl. XI, figs. 6, 6a.
1886. *Napopora irregularis* Quelch, Chall. Exped., XVI: 186; pl. VIII, figs. 6, 6a.
1905. *Porites* "Society Islands (3) (2)," Bernard, The Genus Porites, p. 29, pl. X, fig. 4.

Station No. 6080. In shallows, surface of protected fringing reef at Auae, near Papeete, Tahiti.

PORITES (SYNARAEA) CONVEXA (Verrill)

1864. *Synaraea convexa* Verrill, Bull. Mus. Comp. Zool., i, p. 43.
1905. *Porites* "Society Islands (3) 3," Bernard, The Genus Porites, p. 30, pl. I, figs. 3, 4, 5; pl. X, fig. 5.

Stations Nos. 6078, 6079. Protected fringing reef at Auae, near Papeete.
Nos. 6055, 6056. Growing in clumps on outer edge of protected fringing reef off Fareute Point, Papeete.

PORITES (SYNARAEA) UNDULATA (Klunzinger)

1879. *Synaraea undulata* Klunzinger, p. 48, pl. 6, fig. 12; pl. 5, fig. 30.
1906. *Porites undulata* von Marenzeller, Denkschr. k. k. Akad. Wiss. Wien, **80**: 66; pl. 22, fig. 75. (With synonymy).

Station No. 6083. On protected fringing reef at Auae, near Papeete, Tahiti.

MILLEPORA TRUNCATA Dana

1846. *Millepora platyphylla, β truncata* Dana, U. S. Expl. Exped., Zooph., p. 548, pl. 53, fig. 2.
1918. *Millepora truncata* Vaughan, Carnegie Inst. Wash., Pub. 213, p. 207, pl. 93, figs. 3, 3a, 3b.

Station No. 6049. In large and deeply indented, sulphur-yellow masses, along sides of small tideway, (exposed) fringing reef at Arue.

DISTICHOPORA VIOLACEA (Lamarck)

1846. *Distichopora violacea* Dana, U. S. Expl. Exped., Zooph., pl. 60, figs. 3, 3a.

Station No. 6071. Deep blue, scattered colonies, in crevices and underneath overhanging corals, abundant on the inner (sheltered) slope of barrier reef off Papeete.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

BIOLOGICAL SOCIETY

736TH MEETING

50TH ANNUAL MEETING

The 736th regular and 50th annual meeting of the Biological Society was held in the New Assembly Hall of the Cosmos Club May 18, 1929, at 8.10 p.m., with President GOLDMAN in the chair and 23 persons present. New members elected: F. W. APPEL, J. I. HAMBLETON, J. M. HOLZWORTH.

The reports of the Recording Secretary, Corresponding Secretary, Treasurer, and Publication Committee were read and ordered accepted and placed on file. The report of the Auditing Committee was presented. Dr. OBERHOLSER gave an informal report for the Board of Trustees.

The election then took place, resulting as follows:

President, ALEXANDER WETMORE; *Vice-Presidents*, C. E. CHAMBLISS, H. H. T. JACKSON, C. W. STILES, T. E. SNYDER; *Recording Secretary*, S. F. BLAKE; *Corresponding Secretary*, W. H. WHITE; *Treasurer*, F. C. LINCOLN; *Members of Council*, H. C. FULLER, W. R. MAXON, A. A. DOOLITTLE, I. HOFFMAN, and E. P. WALKER.

The following amendments to the Constitution and By-Laws were then adopted:

1. For Constitution, Art. III, substitute:

   The members of the Society shall be persons who are interested in biological science. There shall be two classes of members, active and emeritus.
2. In By-Laws, Art. I, delete paragraph 1.
3. For By-Laws, Art. I, paragraph 2, substitute:

   Active members in government service who are retired for age or disability, and members not in government service upon reaching the age of 70, may be transferred by the Council to the class of emeritus members. Emeritus members shall have all rights and privileges of active members, including that of receipt of such notices and publications of the Society as they were receiving at time of such transfer, without payment of any further dues. These provisions shall apply only to those who have been members for at least fifteen years.
4. In By-Laws, Art. III, paragraph 1, omit the words "and corresponding."
5. In By-Laws, Art. III, paragraph 2, omit "of either class."

The business meeting adjourned at 9.05 p.m., and a special meeting, with President WETMORE in the chair, was held in celebration of the 50th annual meeting of the Society. Drs. L. O. HOWARD, C. W. STILES, and W. P. HAY presented interesting recollections of the early days of the Society and of some of its prominent members.

S. F. BLAKE, *Recording Secretary.*

BOTANICAL SOCIETY

The 169th to 177th regular meetings of the Botanical Society were held from October, 1923, to May, 1924; the 178th to the 185th from October, 1924, to April, 1925; the 186th to the 193d from October to May, 1926; the 194th to the 202d from September, 1926 to May, 1927; the 203d to the 210th from October, 1927, to May, 1928. The proceedings were not published during this period, the last, that for the 168th meeting, being printed in this JOURNAL in February, 1924. The 200th meeting, held March 1, 1927, was devoted to the history of the society. The addresses were mimeographed and distributed to the members.

211TH MEETING

The 211th meeting was held at the Cosmos Club October 2, 1928.

Program. Address of the retiring President, ROBERT F. GRIGGS: *A new key to the families of flowering plants.*

212TH MEETING

The 212th meeting was held at the Cosmos Club November 6, 1928. The program consisted of several papers on seed germination. E. H. TOOLE: *Dormancy.* Miss A. M. ANDERSON: *Histology* (illustrated). W. L. GOSS: *Current tests.* EDGAR BROWN: *Interpretation* (illustrated).

213TH MEETING

The 213th meeting was held at the Cosmos Club December 4, 1928.

Biographical sketches were given of members who had died during the year, F. G. O'DONNELL by N. REX HUNT, and J. N. ROSE by WALTER H. EVANS.

Program. FREDERICK V. COVILLE: *Recent experiments with blueberries* (illustrated).

S. F. BLAKE: *Recent studies on the genus* Bidens.

O. M. FREEMAN: *The propagation of the flowering dogwood,* Cornus florida L. (illustrated).

214TH MEETING

The 214th meeting was held at the Cosmos Club January 11, 1929.

Program. H. H. MCKINNEY: *Studies on viruses and mosaic diseases* (illustrated).

M. B. MCKAY: *Status of curly top in the west* (illustrated).

C. H. GODFREY: *Pineapple culture in Hawaii* (illustrated).

215TH MEETING

The 215th meeting was held at the Cosmos Club February 5, 1929, with President GRIFFITHS in the chair.

Program. EDGAR T. WHERRY: *Studies on eastern Phloxes* (illustrated).—In the course of studies on soil reaction as related to plant distribution it was found that the species of *Phlox* in the eastern United States had never been satisfactorily characterized, so work on them has been started. The Section *Subulatae,* comprising creeping types with narrow persistent leaves, proves to include three species, *Phlox nivalis* Lodd. of the southeastern, *P. subulata* L. of the northeastern, and *P. bifida* Beck of the north-central states. A series of lantern slides was shown, including for each species his-

torical records, habitat views, and close-ups bringing out their significant features. (*Author's abstract.*)

Mrs. A. M. HURD-KARRER. *Temperature effects on leaf acidity and moisture in relation to vigor of the wheat plant* (illustrated.)—The concentration of hydrogen ions in leaf juice of both spring and winter wheats grown at temperatures of 12–18, 20–25, and 25–30° C., respectively, was lowest at the low temperature and highest at the high temperature. Plants growing at the medium temperature had the lowest "titratable acidity," however. The magnitudes of the titratable acid values were closely correlated with the specific gravity measurements and with the percentages of dry matter in the leaves, which were also lowest at the medium temperature and highest at the high temperature. The increase in hydrogen-ion concentration induced by the higher temperatures was found to depend on the adaptability of the variety to the particular temperature, the winter wheats being the least adapted to the higher temperatures. Those plants which grew the most vigorously had pH values near 6.0 throughout their vegetative development, and up to the final stage in the maturation period when the acidity values increased normally. Those plants which were so injured that they failed to develop beyond the shooting stage had much higher hydrogen-ion concentrations at each stage of development, extreme injury being accompanied by values near 5.6 while the plants were still in a vegetative stage. (*Author's abstract.*)

FREEMAN WEISS and W. A. WHITNEY. *Evaporation effects on stock fungous cultures in mechanical and ice-cooled refrigerators* (illustrated).—Based on the theory of action of mechanical refrigerators, on the claims of manufacturers of these appliances, and on the very limited data showing actual performance records in mechanical and ice-cooled refrigerators, it is a commonly accepted notion that the atmosphere of a mechanical refrigerator is relatively dry, that of an ice-cooled refrigerator relatively humid. The cause of the relatively drier atmosphere in mechanical refrigerators is, of course, the condensation of moisture as ice on the evaporator coil, which is usually maintained below 0°C., as contrasted with the giving off of moisture from melting ice in the other type of refrigerator. The opinion that mechanical refrigerators are drier than ice-cooled ones overlooks the fact that the temperatures ordinarily maintained in the two types of refrigerators also differ, and that the circulation of air within the chamber and the rate of air exchange with the surrounding also have an important effect on the evaporating power of the internal atmosphere. Stock fungous cultures are stored in refrigerators principally in order to reduce evaporation and for this purpose mechanical refrigerators have sometimes been considered undesirable. A comparison of the evaporation rate as measured by porous-cup atmometers in two refrigerators of generally similar construction and maintained at approximately the same temperature (48–49°F.) one cooled by ice, the other by a standard refrigerating mechanism, showed that the rate was higher in the ice-cooled chamber, the comparative measures being 0.241 and 0.534 cc. per hour during a test period of 4,008 hours. Uninoculated tubes of an agar culture medium also showed greater drying out in the ice-cooled chamber, the water loss being 0.487 gr. per tube as compared with 0.446 gr. per tube in those stored in a mechanical refrigerator. In this instance, the lower evaporation rate in the mechanical refrigerator is attributed to its more equable temperature and a generally higher humidity. No freezing out of moisture occurred when the mechanical refrigerator was maintained at this temperature. A brief account of the physical factors influencing evaporation was given. (*Author's abstract.*)

216TH MEETING

The annual dinner of the Botanical Society was held at Meridian Mansions Hotel, the evening of March 12, 1929. Secretary and Mrs. WILLIAM JARDINE and Doctor and Mrs. E. W. BRANDES were the guests of honor. The dinner was preceded by a reception by Secretary JARDINE. After the dinner, with Dr. DAVID GRIFFITHS presiding, addresses were made by Secretary JARDINE, Dr. W. A. TAYLOR, and Dr. KARL F. KELLERMAN, followed by the regular program.

E. W. BRANDES: *Botanical explorations in New Guinea* (illustrated with motion pictures).

217TH MEETING

The 217th meeting was held at the Cosmos Club April 2, 1928.

Program. CHARLES F. SWINGLE: *Botanical exploration in Madagascar* (illustrated with lantern slides, motion pictures, and ethnological specimens). —Dr. Henri Humbert, Professor of Botany, University of Algiers, and the speaker left Marseilles June 7, 1928, for Madagascar, on a plant exploration expedition sponsored by the University of Algiers, the Arnold Arboretum of Harvard University and the United States Department of Agriculture. This was Dr. Humbert's third trip to Madagascar, but it was the first time an American botanist had ever visited France's "Great African Island." The party entered Madagascar from the north but most of the time was spent in the little known southwest, an arid region characterized by an extensive and very peculiar native flora, including tree Euphorbias, some 30 or 40 feet high. The expedition traveled partly by automobile, partly by boat, but in the southwest the *filanzana*, a kind of sedan chair, was employed. The speaker returned to Washington in November with the living plant material, while Dr. Humbert remained in Madagascar until February, then going into Tanganyika and Kenya to compare the flora there with that of Madagascar. The party collected some 3000 herbarium numbers, and a considerable quantity of living plants. The real prize of the expedition consisted of living specimens of *Euphorbia intisy*, a plant known to yield a rubber of very high quality, but one practically exterminated because of the ruthless collecting methods employed by the natives. (*Author's abstract*).

218TH MEETING

The 218th meeting was held at the Cosmos Club May 7, 1929.

Program. ERNST ARTSCHWAGER: *Anatomical studies of the epidermis of the sugar cane plant in relation to its taxonomy and genetics* (illustrated).

CHARLES DRECHSLER: *A review of the genus* Pythium *and some related fungi* (illustrated).

VICTOR F. TAPKE: *The rôle of humidity in the occurrence of smut in wheat, oats, and barley* (illustrated).

LEWIS H. FLINT, *Recording Secretary.*

SCIENTIFIC NOTES AND NEWS

International Lighthouse Conference

The first International Lighthouse Conference that has ever been held, met in London in July on the invitation of Trinity House, the English Lighthouse Authority. Trinity House is an organization with a long record of high achievement in the Lighthouse work of the world. It holds a charter granted in 1514, and it has carried out some of the most important lighthouse engineering works, such as the building of the lighthouses on Eddystone Rock and Bishop Rock. It has included among its engineers Smeaton and Douglas, and on the governing board, known as the Elder Brethren of Trinity House, have been many of the noted men of England.

The Conference included representatives of the Lighthouse authorities of 24 countries, and also of a number of local lighthouse organizations and interested industries. The Conference was entirely informal, and its purpose was the exchange of information, and the discussion of problems affecting lighthouse systems; it did not undertake to pass final judgment on any matter. The Conference was opened under the presidency of the Master of Trinity House, the Duke of Connaught, and the Chairman of its meetings was Admiral Mansell, the Deputy Master. Sessions were held from July 8 to July 12, and during the following week inspection trips were made to various works. The principal topics of discussion were lighthouse illuminants, unattended lighting systems, aerial lights, floating aids to navigation, including lightships and buoys, lighthouse structures, fog signals, radiobeacons, and other related matters. Much interesting information was presented, both in formal papers submitted in advance, and in discussion at the Conference. The proceedings will be published by Trinity House. The representatives of the United States were: George R. Putnam, Commissioner of Lighthouses, Washington, J. T. Yates, Superintendent of the Third Lighthouse District, New York, and H. W. Rhodes, Superintendent of the Eighteenth Lighthouse District, San Francisco, all of the Department of Commerce.

Obituary

Harry C. Frankenfield, in charge of the River and Flood Division of the U. S. Weather Bureau, and a member of the Academy, died July 29, 1929, as a result of injuries received when struck by an automobile the evening of July 22. He was born at Easton, Pennsylvania, November 24, 1862, and entered the meteorological service, then under the Signal Corps of the Army, in 1882. After completing the prescribed course at the Signal Service School at Fort Whipple, Virginia, (now Fort Myer) he was assigned to the Central Office in Washington. In 1887 he was put in charge of the Chicago station; from 1894 to 1898 he served at the St. Louis office, and from 1898 to 1920 was one of the official forecasters at the Central Office. He was in charge of the River and Flood Service 1898–1912, and from 1920 to the time of his death. He received the degrees of A.B. (1881) and A.M. (1884) from Lafayette College, and M.D. (1886) from Howard University (which at that time was attended by many white students), and was the author of numerous papers and bulletins, chiefly on topics connected with floods. His outstanding scientific contribution was the development of methods of numerical computation by means of which flood stages at various places can be closely foretold, days to weeks in advance, from the conditions existing upstream.

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